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large extent. The Chinese mammoth has been found in four principal localities: in the Yellow River alluvium near Tientsin, in the loess formation near the centre of Shansi, in Shensi, also on the banks of the Yangtze River in Anhui. It was this last discovery that drew the attention of Tau Hung-king, who belonged to Nanking, and being a noted Taoist, and a writer of the school of Pao Pu-tsz, would feel the deepest interest in the discovery so near his home.—*North China* (*Shanghai*) *Herald.*

MINERALOGY AND PETROGRAPHY.[1]

Petrographical News.—The results of the investigation of the clastic, metamorphic, and eruptive rocks of the Coast Ranges of California, promised by Mr. Becker a few years ago,[2] have recently[3] appeared in an extended form. The principal conclusions of the study have already been referred to in these notes. The proofs which Mr. Becker offers for the correctness of the statements that many serpentines of the Coast Ranges are altered sediments will probably be accepted by most petrographers as sufficient. His conclusion that typical diabases, diorites, and gabbros are likewise derived from clastic materials will not find such ready acceptance, as there seems to be no positive evidence that such rocks were originally sediments, rather than eruptives, which squeezed themselves into fragmental beds, and so caused the formation of a graded series, with sandstone at one end and a holocrystalline rock at the other end. There is no reason to suppose that holocrystalline[4] rocks may not have sometimes originated by metasomatic alteration of fragmentals; but the belief that a rock with the peculiar structure of diabase has originated in this way will require stronger proof for its acceptance than that offered in Mr. Becker's monograph. The presentation of a few illustrations of types of rocks intermediate between the sandstones and the diabases (pseudodiabases of Becker, metadiabases of Dana) would have aided materially in enabling readers of the volume to draw their own conclusions as to the origin of the rocks in question. In the discussion of the massive rocks of the region, the term asperite is proposed as a general one to include all andesitic rocks with a rough trachytic habit. In this portion of the volume are also described andesitic and basaltic glasses, which are much more acid than the holocrystalline rocks with which they are associated. The basalt glass has the composition of an obsidian, and passes into a rock with the appearance of basalt. Analyses I. and II. are of obsidian and basalt respectively :

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[1] Edited by Dr. W. S. Bayley, Colby University, Waterville, Me.

[2] AMERICAN NATURALIST, Aug. 1886, p. 724.

[3] Monographs of the U. S. Geol. Survey, Vol. XIII., pp. 56-175.

[4] Cf. Van Hise. AMER. NATURALIST, 1886, p. 723.

	SiO_2	P_2O_5	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	NiO	CaO	MgO	Na_2O	K_2O	Cl	H_2O	Sp. Gr.
I.	75.40			7.72	1.41		.12		1.55	1.26	8.00	4.52	.12	.43	2.39
II.	57.37	.02	.60	15.66	2.06	4.46.	.27	.41	4.94	8.84	3.05	1.50		.74	2.83.

The difference in structure of the two rocks is supposed to be due to differences in composition of the original magma.——As an introduction to his description of the minerals of the syenite-pegmatite veins of Southern Norway, Brögger[5] gives a short account of the geology of the region in which these veins occur, and gives his reasons for regarding the lattter as eruptive in origin, as against the lateral secretion theory proposed to account for them. Since the article is itself an abstract of a monograph on the geology of the region, it is difficult to give a résumé of its contents. Among the rocks discussed are some new types, to which reference may be made. Laurvikite is a typical augite-syenite composed of anorthoclase (or cryptoperthite) diopside, ægerine, and lepidomelane, with small amounts of barkevikite, olivine, sphene, magnetite, apatite, zircon, nepheline, cancrinite, and sodalite. It is granitic in structure, except on its periphery, where it is developed as the well-known rhombic porphyry. This latter occurs also as dykes in the former and as flows. A variety of the laurvikite, in which oligoclase is present in addition to the anorthoclase, and in which the latter mineral has rectangular rather than the rhombic cross sections which characterize it in the laurvikite Brögger calls augite-mica-syenite, since it contains very little nepheline. Another rock very characteristic of the region is called laurdalite. This is a coarse-grained nepheline-syenite, with or without olivine. It contains more nepheline and sodalite than does laurvikite, and the former mineral is porphyritically developed. It is the rock described by the author as nepheline-syenite[6] in a former publication. The dyke rock corresponding to laurdalite is a nepheline-rhombic-porphyry, which differs from the porphyritic laurvikite in containing nepheline in its ground-mass. Three other varieties of dyke rock corresponding to laurdalite are recognized. The first is granitic, and is called ditroite; the second is trachytic in structure, and has been denominated foyaite; while the third has phenocrysts of elæolite in a granitic ground-mass. This a nepheline-porphyry. Hedrumite is trachytic, but it contains no elæolite, or, if any, but a small quantity. A tinguaite variety of these rocks is also recognized. Among the acid rocks a quartz-bearing augite-syenite is distinguished by the name akerite. This rock is composed of orthoclase, plagioclase, a large amount of brown biotite, idiomorphic diopside, nepheline, sodalite, usually olivine, and nearly always quartz. Its structure is granitic, and its peripheral facies is a quartz-porphyry. Several varieties of the rock were discovered, one of which is a hypersthene-akerite. More acid than akerite is nordmarkite, which is a quartz-syenite, consisting of microperthite, a diopside pyroxene, biotite, glaucophane or ægirine, and arfvedsonite, sphene, and a little zircon. It is granitic, with quartz in ordinary granite form. Since the rock contains less than 66% of SiO_2 it is called quartz-syenite, rather than soda-granite. The corresponding effusive rock is a quartz-rhombic-porphyry, with a poicilitic ground-mass of quartz and feldspar. Soda-granite is developed in several varieties, among which hornblende, arfvedsonite, and ægirine varieties are the most important. The structure of the rock is not strictly granitic, consisting, as it does, of a ground-mass composed of short rectangular orthoclase, quartz, needles of ægirine, apatite, etc., with a few phenocrysts of microcline and ægirine. The author proposes that the rock be called grorudite. Very many more special phases of these various rocks are recognized, but a full description of them is left to the promised monograph. The larger part of the introductory portion of the volume is occupied with arguments to show that the pegmatitic veins so common in South Norway, as well as in other regions of old rocks, are true fillings of fissures by what was once a molten magnea.——Toula[7] announces the results of the examination of rocks collected during several trips through the Balkans. The rocks of the Central Balkans are divided into massive rocks and crystalline-schists, among the former of which granite, diorites (including nadel-diorite), uralite-diabase, microgranite, orthophyres, porphyrites, pepheline-basalt, limburgite, and andesitic and porphyritic tufas are described; among the latter granitic, hälleflinta and other gneisses and quartz-phyllites are mentioned. In the Eastern Balkans are fossiliferous sandstones and limestones and eruptive rocks, including granites, diorites, porphyrites, quartz-porphyry, andesites, and trachytes of various kinds, phonolites, augitites and tufas.——Lacroix[8] announces the discovery of a peculiar rock, composed of garnets, quartz, orthoclase, oligoclase, nitite, and diaspore, occurring in blocks cast from a volcano near Bournac in the Auvergne.——Mr. Nason[9] gives a brief description of the crystalline rocks occurring in the Highlands of New Jersey.

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[5] *Zeits. f. Kryst.*, etc., XVI., 1890.

[6] Silur. Elagen, 2 and 3, p. 273.

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[7] *Neues Jahrb. f. Min.*, etc., 1890, II., pp. 263, 273.

New Minerals.—In addition to the numerous new minerals lately discovered by Börgger in the Scandinavian Peninsula, five others have recently been described. These latter are from Sweden ; the discovery of them is due to Igelström.[9]——*Talcknebelite*, from the iron mine Hilläng, Ludvika Parish, Gouvernement Dalekarlien, is associated with small red garnets. In appearance it resembles *igelströmite*, but is lighter and has a pearly lustre on a fresh fracture. In composition it is a magnesium bearing knebelite as follows: $SiO_2 = 33.1$; $FeO = 42.6$; $MnO = 21.6$; $MgO = 4.7$.——*Ferrostibian* has been found imbedded in massive rhodonite at the Sjögrufvan Mine, Grythyttan, Oerebo. The crystals are quite large. They are probably monoclinic, and bounded by oP, $\infty P \overline{\infty}$ and $\infty P \grave{\infty}$. They are black and opaque, with a brownish-black streak, and are weakly magnetic. They have a hardness of 4, and in thin section are blood red in color. The mineral dissolves with great difficulty in the usual reagents. An analysis gave:

SiO_2	$(MgCa)Co_3$	Sb_2O_5	FeO	Mno	H_2O
2.24	2.14	14.18	22.60	46.97	9.19

Regarding the silica and carbonate as impurities, and the manganese and iron as in the "ous" condition (which could not be proven), the analysis may be expressed by the formula $10\,RO.\,Sb_2O_5 + 10\,(RO.\,H_2O)$.——*Pleurasite* is a hydrate arsenate from the same mine. It is implanted in arseniopleite. It is bluish-black and opaque, but in thin section becomes pale red. It has a half metallic lustre, a black streak tinged with red, and a hardness of 4, and is very weakly magnetic. It dissolves readily in dilute hydrochloric acid, and yields a yellow solution. Analyses have not yet been made, but qualitative tests indicate that it is a hydrated manganese iron arsenate, containing some antimony.——*Stibiatite*, also from the same mine, occurs in small crystals imbedded in polyarsenite and in irregular grains in veins of various minerals cutting the manganese ores of the mine. The crystals appear to be orthorhombic. They are raven black and perfectly opaque even in the thinnest sections. They are easily soluble in hydrochloric acid and are not magnetic. An approximate analysis gave: $FeO = 26$; $Mn_2O_3 = 44$; $Sb_2O_5 + H_2O = 30$.——*Neotesite*, also from the Sjögrufvan, occurs in lamellar masses associated with tephroite, pyrrhoarsenite, and calcite. It resembles in appearance red orthoclase. It has a good cleavage, a hardness of 5–5.5. It is soluble in acids, leaving a residue of flocculent silica. Its composition:

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[8] Bull. Soc. Fran. d. Min., Jan. 1890, p. 7.

[9] Ann. Rep. State Geologist of New Jersey for 1889, p. 30.

[9] *Neues Jahrb. f. Min.*, etc., 1890, I., p. 248.

SiO_2	MnO	FeO	MgO	H_2O
29.50	40.60	tr.	20.05	9.85

corresponds to $(MnMg)_2SiO_4 + H_2O$, *i.e.*, to a hydrated tephroite. The author, however, does not regard it as a decomposed tephroite.——*Antlerite* is a light green, massive mineral from the Antler Mine, Mohave County, Arizona, which, according to Hillebrand,[10] has a specific gravity of 3.93, and a composition as follows: $CuO = 67.91$; $ZnO = 16.5$; $CaO = .05$; $SO_3 = 20.77$; $H_2O = 10.93$, corresponding to $3 \, Cu \, SO_4 + 7 \, Cu(OH)_2$.——*Selen-tellurium*, from El Plomo Mine, Tegucigalpa, Honduras, is nearer in composition to native selenium, according to Messrs. Dana and Wells,[11] than any substance known. It is regarded as an isomorphous mixture of the two metals indicated by its name, in the proportions $Se = 29.31$, $Te = 70.69$. It occurs massive, has an indistinct columnar structure, and is blackish-gray in color. Its cleavage indicates hexagonal crystallization.——*Durdenite*, a greenish-yellow mineral associated with native tellurium, is thought by the same authors to be a ferric tellurite corresponding to $Fe_2(FeO_3)_3 + 4 \, H_2O$, but differing from the ferric tellurite described by Hillebrandt under the name emmonsite.——*Hamlinite.*—Messrs. Hidden and Penfield[12] describe a rhombohedral mineral occurring at Stoneham, Maine, in small crystals, associated with herderite, margarodite, and bertrandite. The material available for study was so small that no chemical analysis of it was possible. The crystals are bounded by oR, R, and —2R, with oR predominating, $a : c = 1 : 1.135$. The cleavage is perfect, parallel to the base, and the lustre on this face is pearly, while on the rhombohedral faces it is vitreous and greasy. The double refraction is weak and positive. Hardness $= 4.5$; Sp. Gr. $= 3.228$. Blowpipe tests prove the mineral to be a phosphate of beryllium and aluminum containing fluorine.——*Phosphosiderite* is a new mineral from the Kalterborn Mine, near Eiserfeld, Siegen.[13] It is in the form of blood red or reddish-violet aggregates lining cavities in an iron ore. It is transparent, and has a hardness of 3.75, and a density of 2.76. In the glass tube it becomes yellow and opaque and loses water. Dissolves in hydrochloric acid, but is almost insoluble in nitric acid. An analysis gave $Fe_2O_3 = 44.30$; $P_2O_5 = 38.85$; $H_2O = 17.26$, corresponding nearly to $2Fe_2O_3\ P_2O_5 + 8H_2O$, which is the formula for strengite. The new mineral differs from strengite in containing about two per cent. less water, and in losing all of this in one stage. Phosphosiderite is orthorhombic, with $a : b : c = .5330 : 1 : .8772$. The cleavage is parallel to $\infty P \breve{\infty}$, which is the predominant form. Prismatic forms are also largely developed. Twins, with $P\bar{\infty}$ the twinning plane, are met with. The mineral is optically positive, with $\infty P \breve{\infty}$ the axial plane and c the acute bisectrix, $2\ V_{na} = 62°4'$ and $\rho > \upsilon$. Pleochroism is $a =$ pale rose, $b =$ carmine, $c =$ colorless.

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[10] Bull. U. S. Geol. Survey, No. 55, p. 48.

[11] *Amer. Jour. Sci.*, July, 1890, p. 78.

[12] *Amer. Jour. Sci.*, June, 1890, p. 511.

Miscellaneous.—The U. S. National Museum has just published two pamphlets of some interest. One is by Mr. Kunz,[14] and contains a readable account of the gems in the possession of the institution. The second is of more special interest to mineralogists. It is a complete catalogue of mineral names, with their synonyms in French, German, and other languages. The volume is by Dr. Egleston,[15] of Columbia. It is intended to serve as an aid to those who arrange and keep in order large collections of minerals, a purpose that it will surely serve.——The first part of volume second of the Report of the Geological Survey of New Jersey[16] contains a full list of the minerals found in that State.——The well-known instrument maker, Fuess,[17] has recently given very full and clear descriptions of some petrographical microscopes manufactured by himself after suggestions offered by practical mineralogists and petrographers, and of some newly-constructed apparatus for use with these. The most novel of the latter are an axial angle apparatus and a goniometer attachable to the stage of the microscopes.

[13] Bruhus and Busz: *Zeits. f. Kryst.*, XVII., 1890, p. 555.

[14] Rep. Smith. Inst., 1885–6, Pt. II., p. 267–275.

[15] Bull. U. S. Nat. Mus., No. 33, Wash., 1889.

[16] Geol. Sur. of N. J. Rep. of State Geol., Vol. II., Pt. I., Trenton, 1889.

[7] *Neues Jahrb. f. Min.*, etc., BB. VI., 1890, p. 55.